

## A review of the dusky-bellied water snake, *Lycodonomorphus laevisissimus* (Günther), with descriptions of two new subspecies

by

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### SYNOPSIS

The variation of the species *Lycodonomorphus laevisissimus* (Günther) is analysed and two new subspecies are described. These are distinguished by a difference in the number of rows of dorsal scales at midbody in one race and a difference in the number of ventral scutes in the other.

### INTRODUCTION

In 1862 Günther described a new species of snake, *Natrix laevisissima*, 'probably from East Indies'. This name was later attached to the species under review. Until now only a single form has been recognized although FitzSimons (1946) suggested that one specimen, TM 21261, might prove to be subspecifically distinct.

I have examined as much of the available material in South Africa as possible. Unfortunately many of the specimens mentioned in previous papers have been lost. I made no attempt to obtain specimens from overseas museums. Thirty-eight specimens were utilized for this paper, all but three of which were examined personally. Dr D. G. Broadley supplied data on the type and on one other specimen. Mr J. Visser supplied data on a third.

The following abbreviations denote the collections housing the specimens used: AM—Albany Museum, Grahamstown; BM—British Museum (Natural History), London; DM—Durban Museum, Durban; DSP—FitzSimons Snake Park, Durban; GS/IK—private collection of G. Setaro and I. Knezovich, Durban; JV—private collection of Mr J. Visser, Camps Bay; LR—private collection of L. R. G. Raw, Durban; NM—Natal Museum, Pietermaritzburg; NMSR—National Museum of Rhodesia, housed at Umtali; TM—Transvaal Museum, Pretoria, and UM—Umtali Museum, Umtali.

### KEY TO THE SUBSPECIES OF *LYCODONOMORPHUS LAEVISSIMUS* (GÜNTHER)

- |   |    |  |    |    |    |    |    |                      |
|---|----|--|----|----|----|----|----|----------------------|
| 1 | a. | Dorsal scales in 19 rows at midbody        | .. | .. | .. | .. | .. | 2                    |
|   | b. | Dorsal scales in 21 rows at midbody        | .. | .. | .. | .. |    | <b>fitzsimonsi</b>   |
| 2 | a. | Number of ventral scutes exceeding 170     | .. | .. | .. | .. |    | <b>laevisissimus</b> |
|   | b. | Number of ventral scutes not exceeding 165 | .. | .. | .. | .. |    | <b>natalensis</b>    |

### SYSTEMATIC ACCOUNT

#### *Lycodonomorphus laevisissimus laevisissimus* (Günther)

*Natrix laevisissima* Günther, 1862, p. 124, pl. ix, fig. 4; 'probably from East Indies'. (In error—known only from South Africa.)

*Lycodonomorphus laevisissimus*, Loveridge, 1953, p. 253.

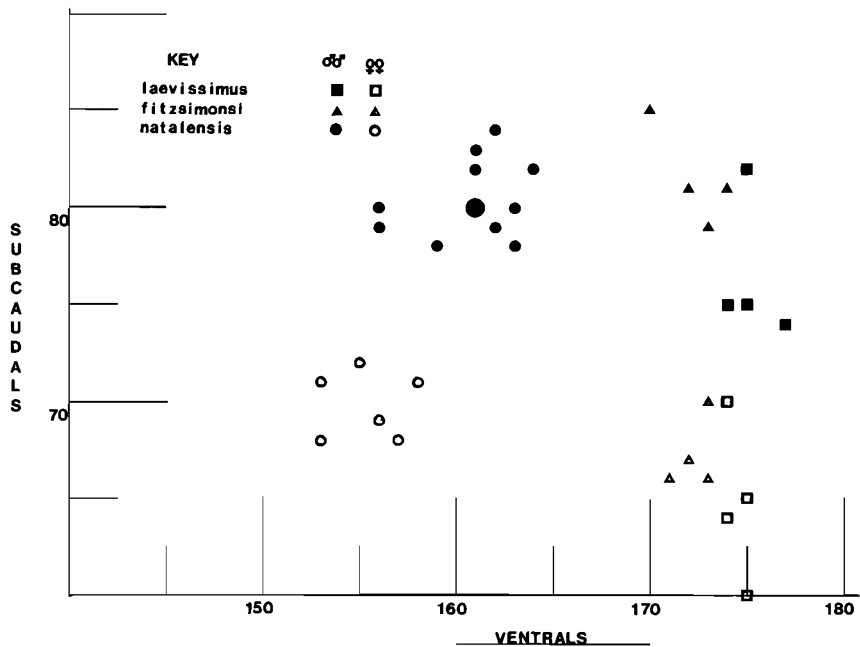


Fig. 1. Scatter diagram showing variation for ventrals (ordinate) plotted against subcaudals (abscissa). The enlarged dot represents two specimens with identical counts.

**Description:** Rostral just visible from above, broader than deep; nostril directed upwards, between two nasals; internasals shorter than prefrontals; frontal longer than broad, shorter than parietals; loreal present, longer than deep, not in contact with backward prolongation of first upper labial; a single preocular; two postoculars; temporals 1 + 2; eight upper labials, fourth and fifth entering orbit; eight lower labials, first four in contact with the anterior sublinguals; pupil round, eye directed upwards and outwards; scales smooth, without pits and in 19 rows at midbody; ventrals 174; anal entire and subcaudals in 75 pairs.

**Holotype:** This is specimen number BM 1946.1.1278 in the British Museum (Nat. Hist.). The above description is adapted from the literature and from data kindly supplied by Dr D. G. Broadley, who has examined the specimen.

**Dentition:** Bogert (1940) has described the maxilla of specimen number 8943 of the American Museum of Natural History. This specimen, from Alicedale, has 25 teeth, 'slightly increasing in size towards the middle of the bone and posteriorly *diminishing* slightly in size'.

**Hemipenis:** Dr Broadley has kindly supplied the following description of the hemipenis of NMSR 4147 from Grahamstown. '(Hemipenis) extends to 12th subcaudal, bifurcating at tip. Sulcus (spermaticus) bifurcates at 8th subcaudal.'

**Colour:** Shiny black to deep mahogany above; ventrum light yellow to deep orange with a dusky-black mid-ventral line, narrow to wide, sometimes almost obscuring the yellow;

sometimes a narrow yellow line on the first rows of dorsal scales, separated from the yellow ventrum by an irregular black streak; throat white; upper labials yellow with dark edgings, sometimes almost completely dark.

*Size:* FitzSimons (1962) records a female of 1 140 mm but the average length is probably less than one metre.

*Distribution:* This subspecies occurs in the Eastern Cape Province, from the vicinity of Port Elizabeth, through the Transkei and East Griqualand, into southern Natal.

*Material examined:* *Cape Province:* Alicedale—TM 12447; East London—TM 32623; Grahamstown—NMSR 4147 (by Dr Broadley); Matatiele—NM 1202.

*Natal:* Underberg—GS/IK (two unnumbered specimens). *Without locality*—TM 5958.

*Other records:* Bloukrans; Clarkebury (Loveridge 1958); Bushmans River; King William's Town; Tsomo; Emfundisweni; Emjanyama; Howieson's Poort; Patensie; Pirie; and Port Elizabeth (FitzSimons 1962). The specimen from Donnybrook listed by FitzSimons (1962) should probably be assigned to this subspecies, but this cannot be confirmed as the specimen has apparently been lost.

***Lycodonomorphus laevisissimus fitzsimonsi* subsp. nov.**

*Neusterophis laevisissimus*, FitzSimons, 1946, p. 379.

*Lycodonomorphus laevisissimus*, Loveridge, 1958, pp. 24, 25.

*Holotype:* TM 21261, an adult male from Lothair, Ermelo District, south-eastern Transvaal.

*Paratypes:* NM 1472—Pietermaritzburg, Natal; NM 1519—24 km north of Paulpietersburg; TM 22662—Carolina, south-eastern Transvaal; TM 32691—Badplaas, south-eastern Transvaal; TM 35712—Cascades, Royal Natal National Park, Natal; DSP—Mooi River Natal; DSP—Rosetta, Natal; JV—Utrecht, Natal.

*Description:* Similar to *laevisissimus* but differs in having 21 dorsal scale rows at midbody. Temporals 1 + 3 on one side, 172 ventrals and 81 pairs of subcaudals. Paratype variations include 2 preoculars (normally 1), 7 upper labials with 3rd and 4th entering orbit (normally 8 with 4th and 5th entering eye), temporal formulae of 1 + 3, 1 + 1 and 1 + 1 + 2 (normally 1 + 2).

*Size:* The largest specimen examined (NM 1472) measured 1 085 mm (867 + 218 mm).

*Breeding:* NM 1472 contains 17 eggs.

*Distribution:* This subspecies occurs above 1 000 metres in altitude, from the Natal midlands northwards into south-eastern Transvaal.

*Other records:* A record from Vant's Drift (FitzSimons 1962) probably should be referred to this subspecies. This specimen is also unfortunately lost.

*Remarks:* This subspecies is named in honour of Dr V. F. M. FitzSimons, who first suspected its existence.

***Lycodonomorphus laevisissimus natalensis* subsp. nov.**

*Tropidonotus laevisissimus*, FitzSimons, F. W., 1919, pp. 82, 446.

*Lycodonomorphus laevisissimus*, FitzSimons, V. F. M., 1962, pp. 104, 105.

*Holotype:* An adult female, UM 27057, from Londen Stream, Hillary, Durban, Natal at an altitude of 65 metres above sea-level. Collected by L. R. G. Raw.

*Paratypes:* UM 27056—same data as type; DM 170, DM 171 and DM 172—Baynesfield, Natal; NM 445 and NM 1133—Pietermaritzburg, Natal; LR 425—Umhlatuzana River,

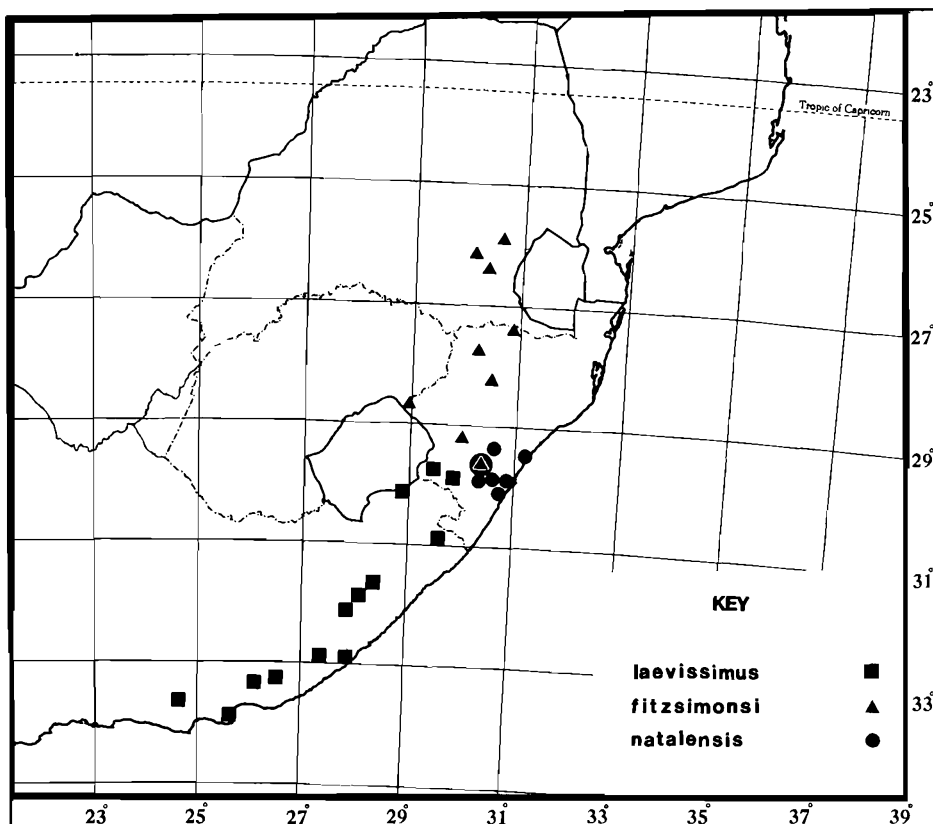


Fig. 2. Distribution of the subspecies of *Lycodonormorphus laevisissimus*. The triangle within an enlarged dot represents the occurrence of both *fitzsimonsi* and *natalensis*. As Pietermaritzburg lies against the escarpment separating these races, actual sympatry is unlikely.

Cavendish, Natal; LR 426—Umhlatuzana River, Coedmore, near Bellair, Durban, Natal; LR 424, LR 534 and TM 42353—Londen Stream, Hillary, Durban, Natal; LR 550, LR 551, LR 552 and LR 553—Baynesfield, Natal; JV 711122—10 km south-west of Cato Ridge, Natal; DSP—Amanzimtoti, Natal; and DSP—Schroeders, Natal.

**Description:** This subspecies agrees with the description of *laevisissimus* in most details. The lower number of ventrals is diagnostic. Holotype has 153 ventrals and subcaudals in 71 pairs.

**Paratype Variation:** NM 445 has single postoculars; UM 27056 has a temporal formula of 1 + 1 + 2; LR 425 has 7 upper labials with 3rd and 4th entering orbit on one side and 6 with 2nd and 3rd entering eye on the other while the lower labials are also reduced in number to 6 and 7, but still with the first four in contact with the anterior sublinguals.

**Size:** This appears to be a smaller form than the other subspecies. The largest specimen measured is a female, UM 27056, which is 785 mm (600 + 185 mm) in length.

**Breeding:** LR 425 laid 8 eggs in early January.

*Field and other observations:* A more aquatic form than *L. rufulus*, often seen swimming, completely submersed, along the beds of streams and rivers. Often seen to be active during the day in wild specimens but captives tend to hide during the day and emerge at night. These snakes seem very susceptible to dehydration and soon die without water.

*Diet:* Has been observed to feed on frogs, tadpoles (*Rana*, *Phrynobatrachus*, etc.), and fish (*Tilapia*). Large animals are constricted but small ones are merely seized and rapidly swallowed while still struggling. Animals caught underwater are eaten without the snake surfacing for air unless swallowing is prolonged when the snake will drag its prey to a position above the surface before resuming (R. Parker—personal communication).

*Distribution:* Occurs below 1 000 metres altitude along rivers and streams from the coast in the vicinity of Durban extending inland to the midlands of Natal.

*Other records:* A specimen from Compensation Beach (FitzSimons 1962), now lost, is probably of this subspecies.

*Remarks:* The name here proposed refers to the fact that this subspecies is entirely confined to Natal.

#### ANALYSIS OF INTRASPECIFIC VARIATION

*Dorsal scale rows:* The usual counts were taken, i.e. at one head-length along neck, at midbody and at one head-length anterior to vent.

*Variation at neck:* In *laevisissimus* 5 specimens have 21 rows while one has 19 and another 20. In *fitzsimonsi* 7 specimens have 21 rows, 2 have 20, one has 19 and another 23. In *natalensis* 11 specimens have 19 rows, 7 have 21 rows and one has 20.

*Variation at midbody:* This count appears consistent for each subspecies. In *laevisissimus* and *natalensis* there are 19 rows and in *fitzsimonsi* 21. *Variation at vent:* This count was 17 rows in all the specimens examined.

*Ventrals:* These counts were taken using the Dowling system. The variation is tabulated in table 1. (See also scatter diagram.)

*Subcaudals:* These counts were taken using the first pair in contact along the midline as the first and the pair immediately anterior to the terminal spine as the last. The terminal spine is not included. See table 2 and the scatter diagram.

TABLE 1  
VARIATION IN THE NUMBER OF VENTRALS

	MALES				FEMALES			
	N	Range	Mean	S.D.	N	Range	Mean	S.D.
<i>laevisissimus</i>	4	174-177	175,25	1,26	4	174-175	174,50	0,58
<i>fitzsimonsi</i>	6	170-174	172,25	1,47	5	171-173	172,20	0,84
<i>natalensis</i>	13	156-164	160,92	2,89	6	153-158	155,33	2,07

TABLE 2  
VARIATION IN NUMBER OF SUBCAUDALS

	MALES				FEMALES			
	N	Range	Mean	S.D.	N	Range	Mean	S.D.
<i>laevisissimus</i>	4	74-82	76,50	3,70	4	60-70	64,75	4,11
<i>fitzsimonsi</i>	4	79-85	81,50	2,52	4	66-70	67,25	1,89
<i>natalensis</i>	12	78-84	80,42	1,93	6	68-72	69,63	1,74

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## REFERENCES

- BOGERT, C. M., 1940. Herpetological Results of the Vernay-Angola Expedition, with notes on African Reptiles in other collections. I: Snakes, including an arrangement of African Colubridae. *Bull. Amer. Mus. Nat. Hist.* 77 (1): 5, 34.
- BOULENGER, G. A., 1893. *Catalogue of Snakes in the British Museum (Natural History)*. 1, p. 226.
- FITZSIMONS, F. W., 1919. *The Snakes of South Africa; their Venom and the Treatment of Snake Bite*. (Cape Town) (3rd edition), pp. 82, 446.
- FITZSIMONS, V. F. M., 1946. Notes on some South African Snakes, including a description of a new subspecies of *Xenocalamus*. *Ann. Transvaal Mus.* 20: 379.
- 1962. *Snakes of Southern Africa* (Cape Town: Johannesburg), pp. 103, 104, 105.
- GÜNTHER, A., 1862. On new species of Snakes in the Collection of the British Museum. *Ann. Mag. nat. Hist.* (3), 11: p. 124, pl. ix, fig. 4.
- LOVERIDGE, A., 1953. Zoological Results of a Fifth Expedition to East Africa. III: Reptiles from Nyasaland and Tete.— *Bull. Mus. Comp. Zool. Cambridge* 110: 253.
- 1958. Revision of Five African Snake Genera. *ibid.* 119, pp. 6, 8, 9, 23, 24, 25.

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